

PERSONAL AUDIO ASSISTANT

PAA2

USER'S MANUAL



PHONIC
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SAFETY PRECAUTIONS

Improper operation and handling of this unit may lead to malfunction. Please read the following precautions before operating.

1. To prevent damage, avoid operating PAA2 under these conditions:

- A Temperatures below 0 degrees C (32 F) or above 40 degrees C (104 F)
- B Strong magnetic waves in nearby areas
- C Static electricity
- D High humidity
- E Sudden temperature changes
- F Large amount of dust in area of operation

2. Avoid placing heavy objects on top of PAA2.

3. DO NOT tear apart PAA2.

4. Never insert foreign objects into measurement microphone, connectors, or other openings.

5. If PAA2 is damaged in any way, immediately turn off the power and contact your reseller. DO NOT continue using the unit.

6. Avoid spilling any liquid on or into PAA2. If spilling or dampening occurs, turn power off immediately and contact your reseller. DO NOT continue using the unit.

 **WARNING!** Always use AA SIZE 1.5V DC alkaline battery or 6 volt DC with 500mA AC power adaptor to power PAA2. Use of an improper power supply will void the manufacturer product warranty. To ensure the accuracy of all measurements please use only the included AC power adaptor.

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PHONIC reserves the right to improve or alter any information supplied within this document without prior notice.

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INTRODUCTION

Thank you for purchasing PAA2, Personal Audio Assistant! PAA2 is a highly accurate audio analyzer that nestles in the palm of your hand, giving you all the tools you need to set up any sound system. With 31-band real-time spectrum analysis, SPL and dBu/dBV/line voltage measurement, EQ setting and phase checking, PAA2 is every sound engineer's best partner. This personal audio assistant is battery powered (4 AA size) to allow for ultimate portability while ensuring the maximum level of accuracy.

With PAA2, you will conquer all acoustic environments with precision and ease. PHONIC understands the importance of sound reproduction management. We know that as a professional, your main concern is sound quality. Consequently, with an audio tool like PAA2, you are given a precise ruler to obtain proper measurements and to guarantee the best possible quality of sound that every professional sound engineer's dreams of. PAA2 is therefore an extremely accurate and effective means for you to gather all the useful data to sharpen your decision in making necessary adjustments to any system setup.

PHONIC also realizes that you need a useful audio tool that is easy and convenient to operate. PAA2 is designed with that concept in mind. Its functions can easily be accessed through its jog control and function buttons in the front. So, turn on your new audio assistant; and let the adventure begin. We are confident you will find that PAA2 really pays off.

To help you get familiar with your PAA2, this manual includes instructions on every function listed in the main menu and sub-menus. Let this manual help you become familiar with this handy device.

FEATURES

- Personal Audio Assistant
- Palm Size Audio Analyzer
- 31-band Real Time Spectrum Analyzer
- Built-in calibrated measurement microphone
- Sound Pressure Level Meter from 30dB~130dB
- Line signal measurement display in dBu, dBV, or Voltage
- A, C weighting or flat
- 3 level range selection for dB SPL and line signal
- Line signal measuring range:
dBu = -50 ~ +40dBu
dBV= -52 ~ +38dBV
Volts = 5mV ~ +80V
- Maximum level display
- Peak hold display
- 4 standard response times:
35ms, 125ms (F), 250ms (M),
1sec (S)
- 10 memories for measurement
and 6 for average calculation
- 31-band EQ setting level display
(boost/cut)
- 160 x 160 graphic display with
back light and contrast
adjustment
- Phase checker
- SPL meter Calibration through
sound level
calibrator (eg: B & K Type 4231)
- Noise generator with pink noise,
1K Hz and polarity test signal,
balanced output
- Low power consumption for over
4 hours continuous operation with
4 AA size alkaline batteries
(Adapter power supply operation
available. When power is used
from adapter, it automatically
cuts off battery power)
- 3 power modes: (1) Power saving
mode: Auto Off- when none of
the buttons has been pressed for
15 minutes (2) Manual Off (3)
Off
- XLR input and output sockets
- RS232 communication port, for
simultaneous operation through
laptop or PC
- One CD-ROM with audio test
signals and software for PC

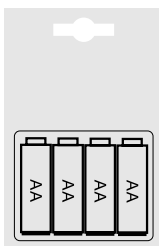
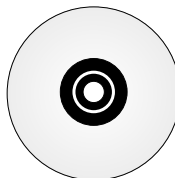
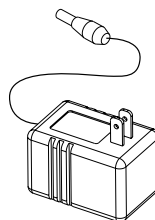
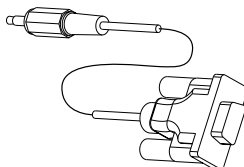
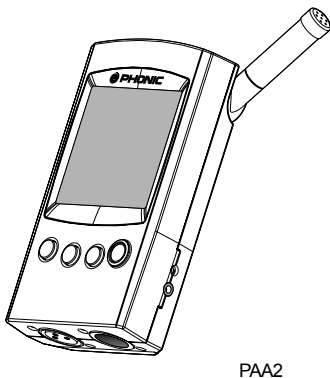
MENU MAP

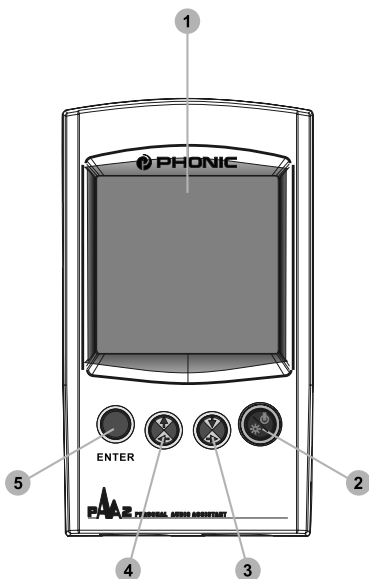
Press the ENTER button or jog control to enter the main menu and sub menus:

Main Menu	Sub-Menu	S2 Menu	S3 Menu	S4	S5	S6
VALUE	(Just-measured or being recalled)					
SPL/LINE	SPL LINE dBu LINE dBV LINE Volt ESC					
MEMORY	STORE	1-10 & ESC	YES (NO)			
	RECALL	1-10, A-F & ESC				
	AVERAGE	1-10, ALL, AVG & ESC	RUN(ESC)	STORE ESC	A-F	YES (NO)
	EQ SETTING ESC	(31 bands display in graphic and digit) ESC				
SETTING	WEIGHTING	FLAT A C ESC				
	LEVEL RANGE	30~90 dB SPL (-50~+10dBu / -52~+8dBV / 5m~2Volt) 50~110 dB SPL (-35~+25dBu / -37~+23dBV / 14m~14Volt) 70~130 dB SPL (-20~+40dBu / -22~+38dBV / 77.5m~80Volt) ESC				
	MAX LEVEL	RESET ESC				
	PEAK HOLD	ON OFF ESC				
	RESP TIME	35 ms 125 ms (F) 250 ms (M) 1 sec (S) ESC				
	CALIBRATION ESC	(Press ENTER to go back)				
PHASE CHECK	+ (In phase) - (Out of phase) ? (Can not detect)	(Press ENTER to go back)				
GENERATOR	OFF PINK NOISE POLARITY 1K Hz ESC					
POWER	AUTO OFF MANUAL OFF OFF ESC					
ESC						

INSIDE THE GIFT BOX

- 1x PAA2
- 4x AA Size Batteries
- 1x AC Power Adaptor
- 1x PC Serial Interface Cable
- 1x Leather Case
- 1x CD-ROM including 26 audio testing signals and software for operation with PC
- 1x User' s Manual





MEET YOUR NEW BEST FRIEND PAA2

PAA2 comes with the following features:
controls and connections:

1. LCD Display

160x160 graphic LCD screen provides
clear and large display.

2. Power On button

Before turning on the power, please
make sure the POWER LOCK switch
in the back is set at the "ON" position.
Then press the Power On button for 2
seconds to turn on the power. After
the power is on, this button will
activate (or turn off) the backlight for
the LCD display.

3. Right / Down button

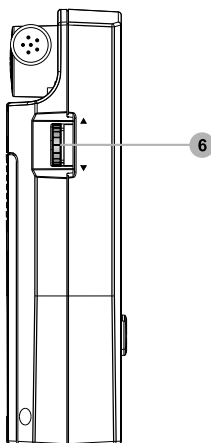
Press this button to highlight a selection
below or to the right of the current
selection.

4. Left / Up button

Press this button to highlight a selection
up or to the left of the current selection.

5. Enter button

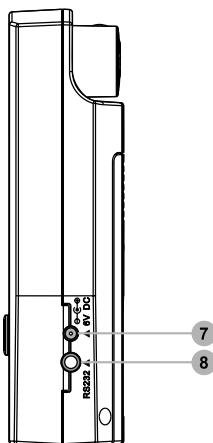
Press this button to move from Real
Time Spectrum Analyzer (RTA) display
to FUNCTION MENU. After moving
the cursor to a desired function in the
menu by the RIGHT/DOWN or LEFT/
UP buttons, press this button to
activate desired function.



6. Jog Control

Jog control, on the left-hand side of this unit, provides the main point of access to the functions in PAA2. Scroll up and down the main and sub-menus with it, and press the jog control button to get into the main menu or sub menu.

Scroll to highlight the desired function, and press it to activate the function. Alternately, the three function buttons (the above-mentioned buttons 3~5) may also be used to scroll, highlight or activate a function.



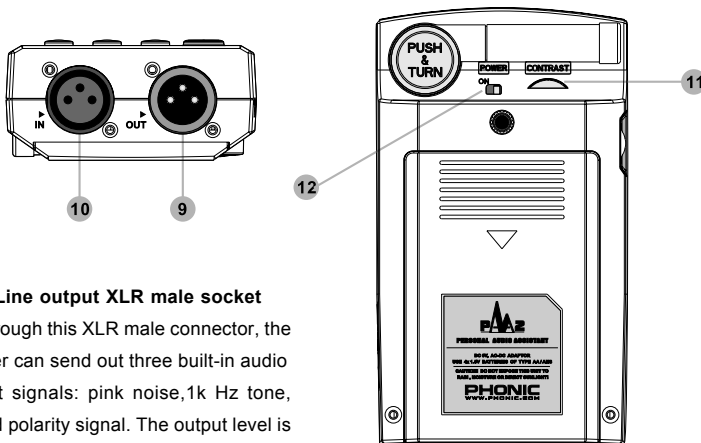
7. 6V DC Power Input

Via this input, the user may connect the power adaptor to PAA2. When adapter is plugged in, the battery power will be replaced by the adaptor.

 **ATTENTION:** Always use the adapter included in this gift box to ensure measurement accuracy and to avoid damaging PAA2.

8. PC Serial Interface port

3.5Ø mini jack allows the user to connect PAA2 to PC with the D-SUB 9-PIN female connector via the PC serial port for simultaneous operation with PC. Please see SIMUTANEOUS OPERATION with PC for more information.



9. Line output XLR male socket

Through this XLR male connector, the user can send out three built-in audio test signals: pink noise, 1k Hz tone, and polarity signal. The output level is balanced -10dBu under 6DV power supply.

10. Line input XLR female socket

This port allows you to send balanced Line-level input to PAA2 via an XLR jack. This signal input allows you to measure line-level in dBu, dBV or AC voltage for balanced, unbalanced signal, or to check the phase of the input signal.

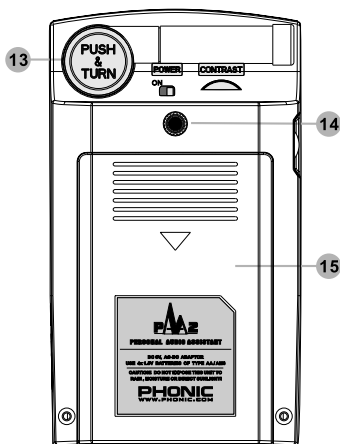
Do not send DC voltage via this connector into PAA2, it will cause permanent damage to the unit.

11. Contrast control

By adjusting this control, the user can obtain better resolution from LCD when needed.

12. Power lock

Set this switch to the "ON" position before turning on PAA2. Set to the "OFF" position to prevent accidental powering of the PAA2 when the unit is not in use. It is recommended to set this switch off when you will not be using PAA2 for a long time.



13. Measurement Microphone

Turn this accurate built-in Omni-directional mic to operation position (stands 45 degrees) by pressing the axis base. Always press the axis base before relocating the mic. Do not turn the mic without first pressing the axis base. This may damage the microphone and result in malfunction.

14. Stand Mount

A stand mount is located on the back for connection to a tripod or any other stand that has a standard #6~20 connecting screw, often found on camera tripods.

15. Battery Holder

PAA2 needs four AA batteries for operation. Alkaline batteries are recommended for maximum operation duration. Under normal operation, PAA2 has over four hours of continuous operation with use of alkaline batteries.

GETTING STARTED

(1) Open the battery cover and insert four AA batteries, or simply plug in the 6-volt DC power adaptor to the power input. When adapter is plugged in, the battery power will be replaced by the adaptor.

 **ATTENTION:** Use only the adaptor included in this gift box to ensure measurement accuracy and to avoid damaging PAA2. When using the adaptor, turn off the (battery) power first to prevent the PAA2 from restarting. Sudden unplugging of the adaptor power may cause the system to crash. You may restore PAA2 by resetting the power lock.

(2) Position the mic for operation by pressing the axis base of the built-in mic. To measure sound pressure level or acoustic power, turn the axis base until the mic stands at 45 degrees.

(3) Set the POWER LOCK to the "ON" position.

(4) Press the power on button in the front for two seconds to turn on the power.

(5) A startup screen will appear for about 10 seconds, then the real time spectrum analyzer with 31-band will appear on the screen. Three types of display are constantly shown at the top of the screen In RTA mode: level range, weighting type, and max level.

(6) If you need backlight for your operation, simply press the power on button; press again to turn the backlight off.

(7) Use the ENTER, UP/RIGHT and DOWN/LEFT buttons to read the level of each 31-band frequency individually and in real-time, or to navigate through the main and sub-menus. Press the ENTER button to enter the main menu and use the UP/RIGHT and DOWN/LEFT buttons to select a function. Then press ENTER again to activate the highlight function or to enter into the sub-menus. The user may also use the jog control to activate all functions.

OPERATION TIPS:

1. All functions can be activated by operating ENTER, LEFT/UP and DOWN/RIGHT buttons, or by the jog control. It is recommended to use these three buttons when taking low SPL measurements.
2. Pressing the ENTER button when the ESC (Escape) is highlighted in most of the function menus will allow you to exit the main menu or sub-menus.
3. Press and hold the ENTER button or jog control for 2 seconds in most of the function menus to return to the real time spectrum analyzer.
4. Press the jog control or ENTER button for 2 seconds to jump to the SPL / Line level meter (enlarged readout) in RTA mode.
5. Always turn off the power by going to the POWER menu. Select OFF if you wish to save the measurement data and function setting into the memory of PAA2.
6. Always prepare extra batteries or external 6V DC power to ensure the accuracy of the measurement. It is not recommended to continue using PAA2 for any measurement when the battery is low.

7. When the result is above the level range, the measurement is still accurate unless CLIPPING has appeared in the LEVEL box during the measurement. When clipping shows, reset the level range.

8. Turn on backlight only when the level range is set at 70~130 dB SPL or -20~+40dBu. A noise will occur when turning on the backlight and it may affect the result of the measurement in the lower range.



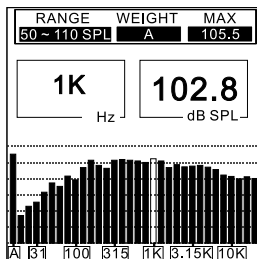
ATTENTION: When the battery is low, a blinking battery icon “BATTERY LOW” will appear at the WEIGHT box and last for 3 minutes on the screen. Low quality batteries may cause PAA2 to shutdown without warning. An enlarged, blinking battery icon will appear in the center of the LCD screen if the user restarts the PAA2 with insufficient battery power.

ACOUSTIC ANALYSIS

FUNCTIONS

The following section contains information concerning acoustic analysis, and illustrates how to use PAA2 to measure SPL level.

RTA (Real Time Analyzer)



Analyze the audio received through the built-in omni-directional mic by dividing the audio spectrum into 31-band, 1/3 octaves, and displaying a bar graph that shows the dB level of each band of sound from 20Hz to 20KHz in four different response times (35ms, 125ms, 250ms, and 1sec) and in three weighting types (A weighting, C weighting and Flat).

Procedures

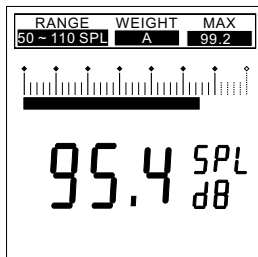
- 1 Approximately 10 seconds after turning on the power, the real time analyzer, with active 31-band center frequency graphic meter, will appear on the LCD screen.
- 2 Go to the SPL/LINE menu and select SPL. Then press ENTER button for two seconds to return to RTA display.
- 3 Go to SETTING menu to set up appropriate WEIGHTING type, LEVEL RANGE, RESPONSE TIME, or to set the maximum or PEAK HOLD display on (or off), Press ENTER for two seconds to return to RTA display.
- 4 Press ENTER to freeze measurement data. Press ENTER again on the highlighted VALUE to view the value of each center frequency.
- 5 Use the LEFT/UP and RIGHT/DOWN buttons or simply scroll the JOG control to view the level of dB SPL in

real-time for the center frequency of all 31 bands. The default readout is the ALL FREQUENCY level.

Beneath you will find two readouts: the numbers in the left column display the frequency while the numbers in the right column display the frequency levels.

The graphic shown indicates that the user has set the level range at 50~110 SPL, A weighting. The max level during the time of measurement is 105.5 dB , The user is reading at 1K Hz, which has a dB SPL of 102.8.

If you would like to store the measurement data in the memory of PAA2, go to the STORE menu. This feature is only available when measuring the SPL. (The user can also save the measured spectrum data into one of the ten memories. Please refer to MEMORY/STORE for more information.)

SPL (Sound Pressure Level)

Measure the loudness of the ambient sound level in units of dB SPL. This is a true RMS-measurement, using standard display time average, and standard A, C, and Flat weighting networks.

Procedures

- 1 Go to the SPL/LINE menu and set the measurement unit at SPL.
- 2 Go to the SETTING/LEVEL RANGE menu and choose an appropriate range. The selected range will also be displayed under the topic of "RANGE".

- 3 Go to the SETTING/WEIGHTING menu and set a desired weighting. (For more information, please refer to WEIGHTING). The selected weighting will be displayed under the topic of "WEIGHT".

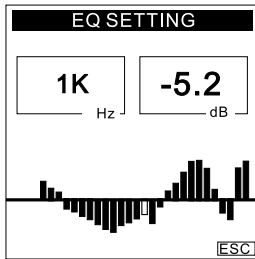
- 4 Go to the SETTING/RESP TIME menu and select an appropriate response time for the measurement. Typically, this is set at 125ms(M).

- 5 Go to the SETTING/MAX LEVEL menu and reset the maximum level reading (at the right top corner) if it is needed.

- 6 Go back to RTA display and press "ENTER" button (or the jog control) for two seconds to enter SPL meter.

Graphic shown indicates that all frequency levels of 95.4 dB SPL, under the level range of 50~110SPL, A weighting are being read.

EQ SETTING



EQ setting will vary from one acoustic space to another. The ultimate goal is to create an ideally flat response for the system and eliminate every possible source of feedback. With STORE, AVERAGE and EQ SETTING functions, PAA2 will help you to quickly accomplish this task.

Procedures

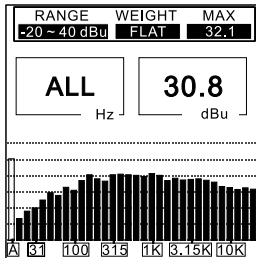
- 1 Run PAA2 in RTA mode.
- 2 Play back pink noise from the included CD or from the PAA2 GENERATOR tool through the system.
- 3 Pick up two or more significant locations/spots among the audience, then take the measurements and save the RTA curve into the memory of PAA2.

- 4 Go to the MEMORY/AVERAGE menu, select the memory measured from those locations, and calculate the average.
- 5 Go to the MEMORY/EQ SETTING menu. You will discover the amount of dB you need to boost or cut in each center frequency by using the Jog. Control or the UP/DOWN buttons to scroll. Example shown indicates that the user should cut -5.2 dB at 1K Hz.



ATTENTION: The average RTA curve is limited by the temperatures and the size of the crowds at the time the measurements were taken.

LINE VOLTAGE MEASUREMENT



Measure the line voltage level in units of dBu, dBV, and voltage, using standard response time, and standard A, C, and flat weighting network (Under normal conditions, please set it at Flat). PAA2 can only measure AC voltage. Using PAA2 to measure DC voltage may damage PAA2 and will void the warranty.

Procedures

- 1 Go to the SPL/LINE menu and set the measurement unit at dBu, dBV, or voltage.
- 2 Go to the SETTING/LEVEL RANGE menu and choose an appropriate range. The selected range will also appear under the topic of "RANGE".

- 3 Go to the SETTING/WEIGHTING menu and set a desired weighting. (For more information, please refer to WEIGHTING). The selected range will also appear under the topic of "WEIGHT". "FLAT" is typically used to measure line voltage.

- 4 Go to the SETTING/RESP TIME menu and select an appropriate response time for the measurement.

- 5 Go to the SETTING/MAX LEVEL menu and reset the maximum level reading (at the right top corner) if it is needed.

- 6 Go back to RTA display. Here you can read the level of any or all frequencies. If all frequency readouts are needed, press "ENTER" button (or the jog control) for two seconds to enter line voltage level meter.



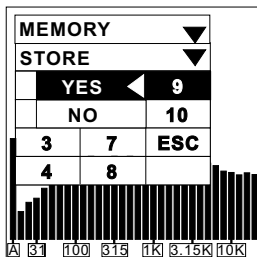
ATTENTION:

1. If the level is lower than 127mV when measuring voltage, PAA2 will show it in mV. If the level is higher than 127mV, the data will be shown in voltage . For example, 120mV will read as 120.0mV, and 200mV will be shown as 0.2V.
2. The measurement for line voltage cannot be saved into the memory of PAA2.

MEMORY

The sub-menus of MEMORY include:
STORE, RECALL, AVERAGE, EQ
SETTING.

STORE



The user can save up to 10 sets of measured data, as well as 6 averaged sets, into the memory of PAA2 for further analysis or uploading.

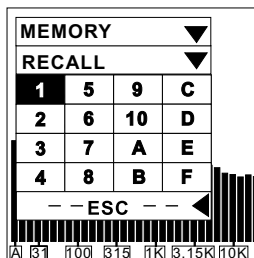
Procedures (after RTA measurement is complete)

- 1 Go to the MEMORY menu and select STORE.
- 2 Select a number from 1~10, and press YES.
- 3 When cursor automatically moves to ESC, PAA2 has finished saving the data and previously saved data will be over-written.



ATTENTION: This function is only available when in RTA mode.

RECALL

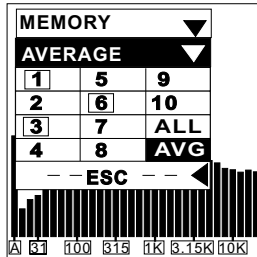


The user can recall all data saved in the memory of PAA2 to make comparisons or to see the differences between the measurements.

Procedures

- 1 Go to the MEMORY menu and select RECALL.
- 2 Select the already-saved data from 1~10 or A~F, and press YES.
- 3 Each value will be displayed under VALUE in a 31-band center frequency value and an all frequency value.
- 4 When you see a flashing ESC in the Hz column, press ENTER to return to the MEMORY menu.

AVERAGE



The user can choose from memory 1~10 to compute average calculations, which are essential for EQ setting.

Procedures

- 1 Go to the MEMORY menu and select AVERAGE.
- 2 Select any combination of data from memory 1~10 by moving the cursor to that number and pressing the ENTER button, or simply choose ALL if you want to do the average calculation for all ten saved measurements . If you want to undo the selection, move the cursor to the selected number and press ENTER again.
- 3 The selected number(s) will appear with a square around it (them) for identification.

- 4 Press AVG when all selections have been made. A list of selected measurements will be shown for confirmation.
- 5 Press RUN and PAA2 will automatically calculate the average, or press ESC to cancel.
- 6 After you run the average calculation, COMPLETE will appear on the screen. The user may then select results from A-F and press YES to save selected average calculations to PAA2 . Previously saved data will be over-written. Saving new results will over-write previously saved data. PAA2 will automatically go to EQ SETTING menu as soon as calculations are complete. Example shown means the user has selected memory 1, 3 and 6 for average calculation.

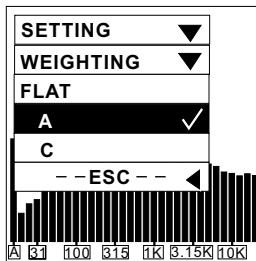


ATTENTION: It is not recommended to calculate average of saved data with different weighting settings. PAA2 will ignore the peak value when calculating the average, even if the peak value was activated.

SETTING

The sub-menus of SETTING include WEIGHTING, LEVEL RANGE, MAX LEVEL, PEAK HOLD, RESPONSE TIME, and CALIBRATION.

WEIGHTING



A sound level meter must be designed so that it hears the sound level in the same way as humans.

Generally, the sensitivity of human hearing is restricted to the frequency range of 20Hz to 20KHz. The human ear, however, is most sensitive to sound in the range of 500Hz to 8,000Hz. The ear becomes progressively less sensitive to sound above or below this range. To account for this characteristic of human hearing, sound pressure level meters incorporate a filtering of acoustic signals according to frequency. This filtering (weighting type) is devised to correspond to the varying sensitivity of the human ear to sound over the audible frequency

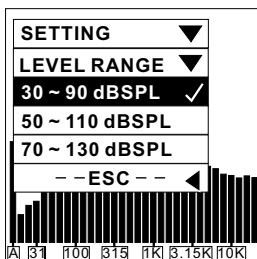
range. PAA2 comes with both A-weighting and C-weighting standardized by the ANSI, American National Standards Institute. A-weighting is the most frequently used weighting type and is used for measuring lower sound levels, while C-weighting is used for higher sound levels.

The user can set the weighting for measurements in dBu, dBV or voltage.

Procedures

- 1 Go to the SETTING/WEIGHTING menu.
- 2 Select an appropriate weighting for the measurement and press YES.
- 3 Press ESC to return.

LEVEL RANGE



PAA2 has three different ranges for measurements in SPL, dBu, dBV and voltage.

SPL : 30~90, 50~110, 70~130

dBu : -50~+10, -35~+25, -20~+40

dBV: -52~+8, -37~+23, -22~+38

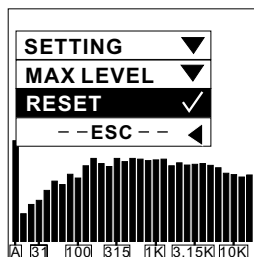
Voltage: 5m~2.45V, 14m~14V

77.5m~80V

Procedures

- 1 Go to the SETTING/LEVEL RANGE menu.
- 2 Select an appropriate range for the measurement and press ENTER button.
- 3 Press ESC to return.

MAX LEVEL

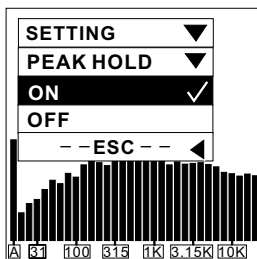


Maximum level will constantly be shown and measured on the LCD screen. The user should reset the max level before each new measurement.

Procedures

- 1 Go to the SETTING/MAX LEVEL menu.
- 2 Highlight RESET and press ENTER button to reset the max level measurement. The menu will automatically return to the SETTING sub-menu. Press ESC to return if it you do not want to reset.
- 3 A new max level display will be shown in the MAX column three seconds after returning to the RTA operation.

PEAK HOLD



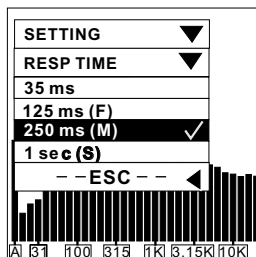
Peak hold allows the user in RTA mode to constantly display the peak values of all measured frequencies, individually or collectively.

Procedures

- 1 Go to the SETTING/PEAK HOLD menu.
- 2 Highlight ON to activate peak hold display.
- 3 Highlight OFF to cancel peak hold display.
- 4 Press ESC to return.

 **ATTENTION:** When saving the memory with “PEAK HOLD” on, the peak level will only be displayed when the user recalls that memory when the “PEAK HOLD” setting is on. By setting the PEAK HOLD off, the user may then view the levels from all frequencies, individually or collectively.

RESPONSE TIME



Response time settings will vary according to the user's measurement goals.

35 ms: Extremely Fast (for explosive sound)

125 ms(F): Fast

250 ms(M): Middle

1 sec(S): Slow

Procedures

- 1 Go to the SETTING/RESP TIME menu, select an appropriate response time and press ENTER button.
- 2 Or press ESC to return.

CALIBRATION

Under normal operation, you may never need to calibrate your PAA2. Only calibrate PAA2 if measurement data or operation of the unit is abnormal. Anyone can calibrate PAA2 and regain accurate sound pressure level measurement by using a sound level calibrator with 1/2" diameter adapter that sends out 1K Hz tone. The user can use a B&K TYPE 4231 sound level calibrator to calibrate.

Procedures

- 1 Go to SETTING/PEAK HOLD and set it to OFF.
- 2 Go to SETTING/RESP TIME and set it at 250ms(M).
- 3 Place a sound level calibrator with a microphone connector of 1/2" diameter close to the microphone of PAA2.
- 4 Go to the SETTING/CALIBRATION menu and activate the function.
- 5 Adjust the level measured from the SPL calibrator by pressing UP/DOWN buttons until the level reaches that of the sound level calibrator. Pressing the UP button each time will increase the value by 0.1dB; pressing the DOWN button

each time will decrease by 0.1 dB. The user will need to adjusting until the readout of the PAA2 is identical with the one of the standard SPL calibrator.

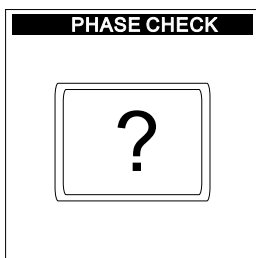
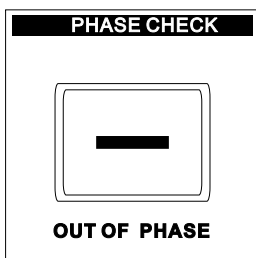
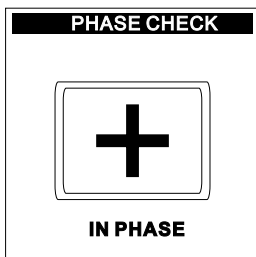
- 6 Press the ENTER button to complete the calibration and to return to RTA display.



ATTENTION:

- (1) Under normal operation, you may never need to calibrate your PAA2.
- (2) If you want to cancel the calibration function, press the ENTER button to exit before making any adjustment.
- (3) If you want to restore the default setting, simply use the UP/DOWN buttons to adjust the OFFSET value until it reads 0.0 dB, and then press the ENTER button to complete setting.

PHASE CHECK



Measure the phase of an electrical signal or speaker wiring in order to find out if the signal phase or the speaker wiring is correct. Polarity signal is usually needed for checking the speaker wiring.

Procedures

For electrical signal

- 1 Go to the SPL/LINE and select dBu.
- 2 Go to the SETTING/LEVEL RANGE menu and select an appropriate range for phase checking.
- 3 Send the electrical signal to the female XLR input jack.
- 4 A big "+" means the signal is in phase.
- 5 A big "-" means the signal is out of phase.
- 6 A big "?" means that the signal level is lower than the current level range setting of the PAA2, and it therefore cannot be detected by PAA2.

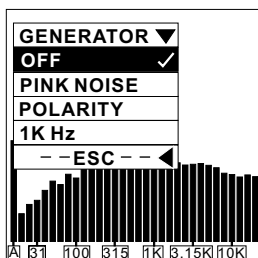
For speaker wiring

- 1 Go to the SETTING/LEVEL RANGE menu and select the high (70~130dB) range for phase checking. (The low range 30~90dB is not recommended for phase checking because the environment noise will affect the result.)
- 2 Go to the GENERATOR menu and select POLARITY (or play the included CD to send out the polarity signal through that speaker).
- 3 Stand one meter in front of the speaker that plays out the polarity signal, go to the PHASE CHECK menu and activate.

- 4 A big “+” means the speaker is in phase, and the wiring is correct.
- 5 A big “-” means the speaker is out of phase, and the wiring of the speaker is incorrect.
- 6 A big “?” or a screen switching between “+” and “-” means the sound pressure level is not detectable .



ATTENTION: Make sure the sound pressure level of the polarity signal from the system is louder than the environment noise, otherwise PAA2 will not be able to detect the phase of the speaker.

GENERATOR

PAA2 can send out pink noise, polarity signal, and 1K Hz tone, via the XLR Male connector, to an external system at -10 dBu(balanced).

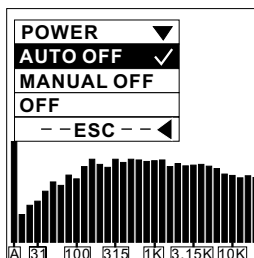
Pink noise: mostly used for acoustic environment adjusting. For example: sound system equalization.

Polarity: often used to check the phase of a signal or speaker wiring.

1K Hz tone:widely used among professionals for audio signal testing.

Procedures

- 1 Connect PAA2 to your system via the XLR-male connector.
- 2 Go to the GENERATOR menu and highlight one of the signals to activate it.
- 3 Press ESC to return or press OFF to cancel.

POWER OFF

There are three kinds of settings to turn off PAA2.

Procedures

- 1 Go to the POWER menu.
- 2 Select AUTO OFF. PAA2 will automatically shut down and turn off its power 15 minutes after the last operation.
- 3 Select MANUAL OFF. PAA2 will not automatically shut down, unless batteries are dead.
- 4 Select OFF. PAA2 will immediately shut down and turn off its power. It is necessary for the user to turn off the power this way if they wish to save the measurement data into the memory of PAA2.

SIMULTANEOUS OPERATION WITH PC

Simultaneous operation with a PC allows for remote control operation in spaces that do not require the presence of an individual to take measurements. By connecting PAA2 to the PC, the user may also save and print data. The software, supported by Windows 98 and above, can be found in the included CD, which also contains 26 testing signals.



ATTENTION: When engaging simultaneous operation with PC, only the mouse and its keys are functional. It is recommended that the user power PAA2 through the power adapter instead of a battery. PAA2 should also be positioned properly before engaging remote control.

Procedures for installation and simultaneous operation:

- 1 Turn on the PC and insert the CD.
- 2 Find setup.exe, double click to begin installation and follow the instructions.
- 3 Go to start menu and select PAA2 ON LINE. The window of PAA2 ONLINE SOFTWARE will appear on the screen.
- 4 Connect PAA2 to PC via RS232 cable through the serial port and turn on PAA2.
- 5 Go to FILE, select ON LINE to activate simultaneous operation. If you cannot execute ON LINE, please go to OPTION/PORT, select a COM number and run TEST. The software will then automatically detect the current serial port connecting to PAA2 and save the setting. The data previously saved in PAA2 will immediately be uploaded and the icon at the bottom right corner will switch from Off Line to On Line. If no data is saved in the memory of PAA2, it will show a primitive level of 85dB for all frequencies in FLAT with a level range of 30~90 dB SPL.

- 6 As soon as uploading is finished, you may begin to operate PAA2 by moving the cursor of the mouse, clicking the MENU on the PC screen to enter into the menu and sub-menus.
- 7 Now that PAA2 is operating simultaneously with the PC, the function being activated will show on both PAA2 and on PC.
- 8 Go to FILE and click on OFF LINE if you need to disable ON LINE operation.

Once the procedures are finished , you should be able to proceed with the following functions:

PRINT

- 1 Go to FILE, select Print, and a printer selection window will appear.
- 2 Select a printer from the list.
- 3 Select all data, or one of the 16 memories.
- 4 Select the quality level (Draft, Low quality, Medium quality, or High quality).
- 5 Click on Print, and the printer window will disappear as soon as the transmission is complete.



ATTENTIONS: Along with the 31-band value of the selected memory and the EQ SETTING value, the name of the file, date of printing, LEVEL RANGE, WEIGHTING, and maximum level will also be printed on the data sheet.

SAVE FILE

- 1 Go to FILE, select Save File.
- 2 Select a desired directory or a new destination, and give a name to that file.

- 3 Clip on SAVE to save the file, and all 16 memories will be saved under that one file name

LEQ

LEQ is designed to measure sound pressure level and automatically calculate an average in one fixed interval over a period of time in any live event, therefore, it can only be activated during on line.

- 1 Go to OPTION / LEQ to activate this function.
- 2 Go to SEC menu to select an interval. You can enter 180 hours and 59 minutes at most, or any number between 0.001 and 59 for second)
- 3 Clip on the "eraser(CLEAR)" to clear the measurement data
- 4 Clip on ► (START) to start measuring
- 5 Clip on ■ (STOP) to stop measuring
- 6 Clip on the double disks icon to save the result to one of the six average memory (A~F)



ATTENTIONS: LEQ can only be activated when the PEAK HOLD in your PAA2 is set to OFF. When using LEQ, user will not be able to operate PAA2 and PAA2 ON LINE at the same time.

(BACK) LIGHT

Clip on LIGHT to activate the back light for PAA2, clip again to turn it off.

PEAK HOLD

- 1 Clip on ON to view the peak value of each frequency and all frequency. The level can be found either from the bar meter or in the memory chart.
- 2 Clip on OFF to view the RTA value of each frequency and all frequency

MEMORY (from the memory chart)

Clip on one of the memory number (1~10 or A~F, the number of selected memory would be marked) in the memory chart to view the level in each frequency and all frequency. User can clip on the bar-meter in the spectrum to see a specific frequency

for readout or view them in the RTA Value column.



ATTENTIONS: The user may rename every memory by double clicking the number of the memory in the memory chart. The following functions, along with PORT, are not accessible during on-line.

The following functions, along with PORT, are not accessible during on line.

OPEN FILE

- 1 Go to FILE, select Open File.
- 2 Locate the file previously saved in your PC and double click it.
- 3 The data is now available for further operation.

MEMORY (from the menu)

AVERAGE

- 1 Go to MEMORY / AVERAGE and activate average function.
- 2 Choose by clicking memory 1~10 for average calculation. The original setting of each memory level range will display next to its number.
- 3 Click on AVG to run the calculation.

- 4 Select a memory from A~F, and click on Save to save the result (previously saved data will be over-written), or click on Cancel to exit. The user can view the result (either in graphic or in text) immediately in either the result box or in the memory chart. Level range will be displayed at the top.

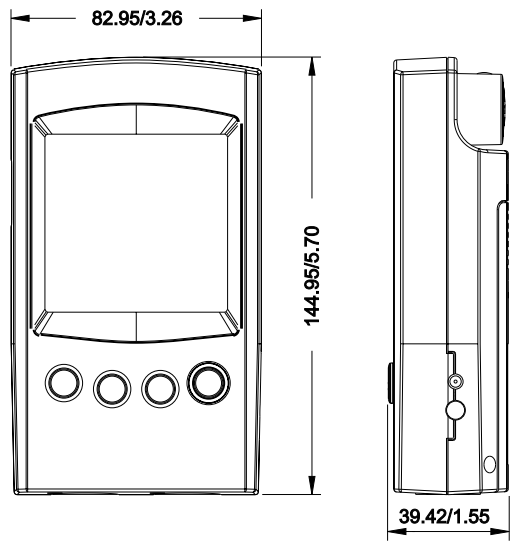
EQ SETTING

- 1 Select a memory (1~10 or A~F to adjust the EQ.
- 2 Go to MEMORY and activate EQ setting function.
- 3 Move the cursor and click on each bar meter to find out how much dB you need to cut or boost for each center frequency.

CLEAR

- 1 Go to MEMORY / CLEAR.
- 2 Select one memory, 1~10 or A~F, from the sub-menu, and the memory will be deleted immediately. Select "All" if you need to delete all the memories that are presently loaded into PC.

DIMENSIONS



	PAA2
Input/Output:	
Microphone	Built-in miniature omni direction condenser microphone
Line	XLR jacks for line input and output
Data Port	3.5mm mini stereo phone jack for RS232
Display :	160X160 LCD screen with contrast adjustment and back light
SPL, dBu, dBV, Voltage	Barograph and digit display
RTA	31-band, 0.5dB resolution Center frequencies ISO standard from 20Hz to 20KHz
Measurement Range:	
SPL (Microphone input)	30 to 130 dB SPL
dBu (Line input)	-50 to +40 dBu
dBV (Line Input)	-52 to +38 dBV
Volatge (Line Input)	5 mV to 80 V
Setting	
Weighting	A, C or Flat
Peak hold	ON/OFF
Maximum level display	RESET
Response time	35 ms, 125 ms, 250 ms, 1 sec

	PAA2
Other function	
Memory	10 RTA+ 6 average calculation
Average calculation	For 10 RTA
EQ setting value display	31-band
Phase checker	Through polarity signal
Transimission	Simultaneous operation with PC or laptop through RS-232
Noise generator(Based on 6VDC power source)	
Pink noise	Balanced output, -10dBu
1K Hz Signal	Balanced output, -10dBu
Polarity Signal	Balanced output, -10dBu
Power Source	4XAA battery (battery life: 4hrs with alkaline battery) or external 6 VDC adapter
Dimensions(H*W*D)	144.95X82.95X39.42mm (5.7"X3.26"X1.55")
Weight(w/battery)	340 g (0.74lbs)

26 AUDIO TEST SIGNALS

The following is the list of the audio test signals on the CD included in the PAA2 gift box:

1. Pink noise -10 dBFS, 60 seconds
2. Polarity testing signal
3. White noise -10 dBFS, 60 seconds
4. 250Hz sine signal -10 dBFS, 30 seconds
5. 500Hz sine signal -10 dBFS, 30 seconds
6. 1KHz sine signal -10 dBFS, 30 seconds
7. 2KHz sine signal -10 dBFS, 30 seconds
8. 5KHz sine signal -10 dBFS, 30 seconds
9. 10KHz sine signal -10 dBFS, 30 seconds
10. 12.5KHz sine signal -10 dBFS, 30 seconds
11. Sweep frequency up 20Hz~20KHz, -10 dBFS, 5 seconds for each frequency: 20Hz, 25Hz, 31.5Hz, 40Hz, 50Hz, 63Hz, 80Hz, 100Hz, 125Hz, 160Hz, 200Hz, 250Hz, 315Hz, 400Hz, 500Hz, 630Hz, 800Hz, 1KHz, 1.25KHz, 1.6KHz, 2KHz, 2.5KHz, 3.15KHz, 4KHz, 5KHz, 6.3KHz, 8KHz, 10KHz, 12.5KHz, 16KHz, 20KHz
12. Channel test -10 dBFS, at 1KHz, left channel
13. Channel test -10 dBFS, at 1KHz, right channel
14. Sweep frequency up 20Hz~20KHz, -20 dBFS, 5 seconds for each frequency
15. In phase, 0 dBFS, at 250Hz, 30 seconds
16. Out of phase, 0 dBFS, at 250Hz, 30 seconds
17. Digital blank, 60 seconds
18. SMPTE/EBU, time code, 30 seconds
19. High E
20. Low B
21. Low G
22. Low D
23. Low A
24. Low E
25. Frequency sweep up, 20Hz~20KHz, 0 dBFS
26. Frequency sweep down, 20KHz~20Hz, 0 dBFS



Information in this document is subject to change without notice.